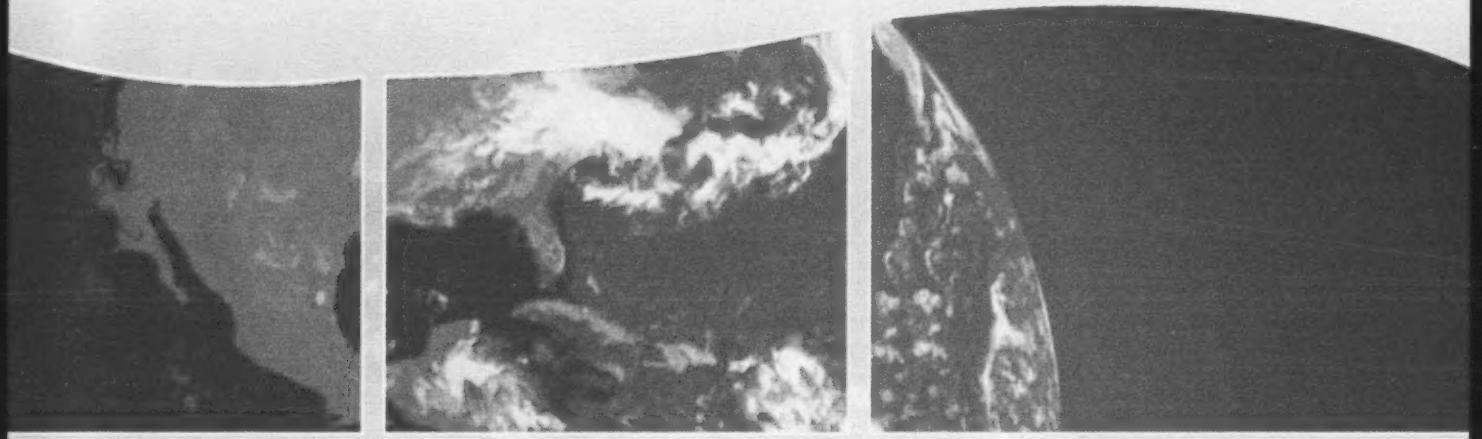
Environment Canada Environnement Canada

Greenhouse Gas Emissions Reporting

Technical Guidance on Reporting Greenhouse Gas Emissions

April 2012



Canada

Library and Archives Canada Cataloguing in Publication

Canada

Main entry under title:

Greenhouse Gas Emissions Reporting: Technical Guidance on Reporting Greenhouse Gas Emissions.

Annual.

2012 reporting year.

Issued by the Pollutant Inventories and Reporting Division

Other editions available: Déclaration des émissions de gaz à effet de serre : guide technique pour la déclaration des émissions de gaz à effet de serre.

Cat. No.: En81-6/2011E-PDF

ISSN: 1719-0487

1. Greenhouse gases – Canada – Measurement – Handbooks, manuals, etc.
2. Pollutants – Recording – Canada – Handbooks, manuals, etc.
3. Greenhouse gases – Government policy – Canada – Periodicals.
4. Environmental monitoring – Canada – Periodicals.

I. Canada. Environment Canada.

II. Canada. Pollutant Inventories and Reporting Division.

III. Title.

IV. Title: Technical guidance on reporting greenhouse gas emissions.

Pollutant Inventories and Reporting Division, Environment Canada
Fontaine Building, 8th Floor
200 Sacré-Coeur Boulevard
Gatineau QC K1A 0H3
Telephone: 819-994-0684
Fax: 819-953-2347
Email: ges-ghg@ec.gc.ca

Information contained in this publication or product may be reproduced, in part or in whole, and by any means, for personal or public non-commercial purposes, without charge or further permission, unless otherwise specified.

You are asked to:

- Exercise due diligence in ensuring the accuracy of the materials reproduced;
- Indicate both the complete title of the materials reproduced, as well as the author organization; and
- Indicate that the reproduction is a copy of an official work that is published by the Government of Canada and that the reproduction has not been produced in affiliation with or with the endorsement of the Government of Canada.

Commercial reproduction and distribution is prohibited except with written permission from the Government of Canada's copyright administrator, Public Works and Government Services of Canada (PWGSC). For more information, please contact PWGSC at 613-996-6886 or at droitdauteur.copyright@tpsgc-pwgsc.gc.ca.

Cover photo: © Photos.com – 2011

© Her Majesty the Queen in Right of Canada, represented by the Minister of the Environment, 2012

Aussi disponible en français

Table of Contents

GLOSSARY OF TERMS 1

PREFACE 2

1 REPORTING PROCESS OVERVIEW 3

2 REPORTING CRITERIA 5

2.1 Reporting Threshold 5

2.2 Greenhouse Gases Subject to Reporting 6

3 BASIC CONCEPTS FOR REPORTING EMISSIONS 7

3.1 Relationship with UNFCCC and IPCC 7

3.2 Key Elements in Calculating Emissions 8

3.3 Prioritizing Efforts 9

3.4 Biomass Emission Considerations 9

3.5 Auditing and Verification 10

4 EMISSIONS REPORTING FORMATS 11

4.1 Reporting Emissions Data 11

4.2 Carbon Dioxide, Methane and Nitrous Oxide Emissions 11

4.3 Hydrofluorocarbon, Perfluorocarbon and Sulphur Hexafluoride Emissions 15

4.4 Estimation Methods 16

APPENDIX A : Frequently Asked Questions 19

APPENDIX B : References 30

GLOSSARY OF TERMS

The following words and terms used in this guidance document shall have the indicated meaning:

Biomass means plants or plant materials, animal waste or any product made of either of these. Biomass includes wood and wood products, charcoal, and agricultural residues and wastes (including organic matter such as trees, crops, grasses, tree litter, or roots); the portion of biologically derived organic matter in municipal and industrial wastes; landfill gas; bioalcohols; black liquor; sludge gas; and animal- or plant-derived oils.

Carbon dioxide equivalent (CO_2 eq) is a unit of measure used to allow the addition of or the comparison between gases that have different global warming potentials (GWPs). Since many GHGs exist and their GWPs vary, the emissions are added in a common unit, CO_2 eq. To express GHG emissions in units of CO_2 eq, the quantity of a given GHG (expressed in units of mass) is multiplied by its GWP.

CAS Registry Number, or CAS Number is a unique numerical identifier in the Chemical Abstracts Service Registry that is given to every chemical that has been described in the literature. The Chemical Abstracts Service, a division of the American Chemical Society, assigns these identifiers.

CO_2 emissions from biomass decomposition are releases of CO_2 resulting from aerobic decomposition of biomass.

Contiguous facility means all buildings, equipment, structures and stationary items that are located on a single site or on contiguous or adjacent sites; are owned or operated by the same person; function as a single integrated site; and include wastewater collection systems that discharge treated or untreated wastewater into surface waters.

Direct emissions are releases from sources that are located at the facility.

Facility means a contiguous facility, a pipeline transportation system, or an offshore installation.

GHGs means greenhouse gases.

GWP means global warming potential. It is calculated as the ratio of the time-integrated radiative forcing (i.e. the amount of heat-trapping potential, measured in units of power per unit of area, e.g. watts per square meter) that would result from the emission of 1 kg of a given GHG to that from the emission of 1 kg of CO_2. For example, the GWP for nitrous oxide (N_2O) is 310, which means that 1 kg of N_2O emissions is equivalent to 310 kg of CO_2 emissions.

HFCs means hydrofluorocarbons.

Offshore installation means an offshore drilling unit, production platform or ship, or sub-sea installation and that is attached or anchored to the continental shelf of Canada in connection with the exploitation of oil or gas.

PFCs means perfluorocarbons.

Pipeline transportation system means all pipelines that are owned or operated by the same person within a province or territory and that transport processed natural gas and their associated installations including storage installations but excluding straddle plants or other processing installations.

Reporting company means a person who operates one or more facilities that meet the reporting threshold as set out in Schedule 3 of the *Canada Gazette* notice. The latest *Gazette Notice* can be found on Environment Canada's Greenhouse Gas website at: www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=F3E7B38E-1.

PREFACE

Background

Canada has announced that it intends to work towards fulfilling its obligations and domestic climate change policy objectives by ensuring that it has the capacity to quantify, track and report progress on the reduction of greenhouse gas (GHG) emissions in a way that meets a required level of accuracy, thoroughness, transparency and public credibility.

In March 2004, the Government of Canada initiated a phased approach to the collection of GHG emissions data and related information. The program was launched through the publication of the first *Canada Gazette* notice in March 2004, which set out basic reporting requirements. A *Canada Gazette* notice is published every year requiring the reporting of greenhouse gas emissions for the calendar year specified in the notice.

This program continues to be a part of Canada's effort to develop, through a collaborative process with the provinces and territories, a harmonized and efficient single window reporting system to meet the GHG reporting needs of all jurisdictions and minimize the reporting burden for both Canadian industry and governments. A key objective is to provide Canadians with reliable and timely information on GHG emissions and support the development of regulations.

Purpose

The purpose of this document is to provide guidance to potential reporters to help determine if they are required to submit a report and to present technical information related to GHG emissions reporting. This technical information includes the GHGs and emission sources subject to reporting, along with information on methods for calculating emissions and the required reporting format. An overview of the reporting process is also described herein. Separate guidance is available regarding the online reporting system that should be used to submit a report. This guidance includes instructions on how to use the reporting system, how to complete and submit the report and other relevant information.

1 REPORTING PROCESS OVERVIEW

The current GHG reporting requirements stipulate that all persons who **operate** a facility that emits 50 000 tonnes (or 50 kt) of CO_2 eq (the reporting threshold) or more of GHGs in the calendar year are subject to the reporting requirements and must report their emissions information to Environment Canada. Facilities need to calculate their total direct emissions (in CO_2 eq units) of the GHGs covered by this reporting requirement to determine if they are required to report.

If the facility's emissions meet or exceed the reporting threshold, the facility is required to submit a report (see Figure 1 for an overview of the reporting process). If the facility's emissions fall below the reporting threshold, the facility is not required to submit a report but is encouraged to submit a voluntary report nonetheless.

A reporting company with a facility or facilities subject to the reporting requirements must include with the GHG emissions report a statement of certification, signed by an authorized signing officer, indicating that the information submitted is true, accurate and complete. This statement should be submitted electronically with the GHG report through the online reporting system.

The reporting company may also submit, with the GHG report, a written request that the reported information be treated as confidential. If applicable, the reporting company must complete the confidentiality request process, which includes preparing the written request and sending it with the report to Environment Canada.

The information that must be submitted includes general information about the reporting company and facility (e.g. name, address/location, contacts, parent companies, various identifiers) and the GHG emissions information for the facility in question. Each facility is required to report total direct GHG emissions as per the reporting format described in Section 4 of this document.

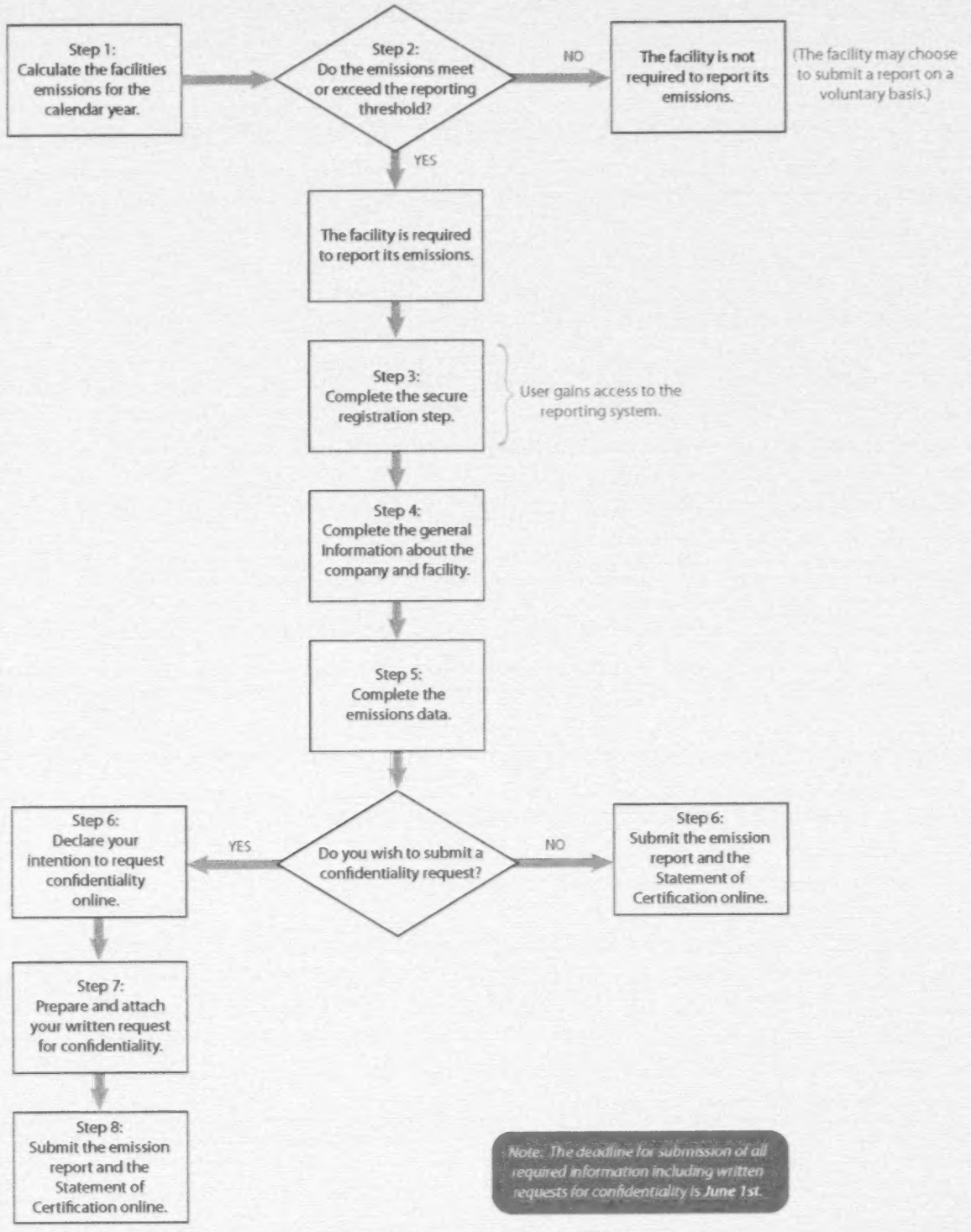
All information (i.e. the GHG report, statement of certification and confidentiality request, if applicable) must be submitted by the June 1st reporting deadline.

If a facility reported emissions in a previous year but does not meet the current year's reporting threshold, they are now required to notify the Pollutant Inventories and Reporting Division.

For any questions about Environment Canada's GHG reporting program (GHGRP), please contact:

Pollutant Inventories and Reporting Division,
Environment Canada
Telephone: 819-994-0684 or
toll-free at 1-877-877-8375
Email: ges-ghg@ec.gc.ca

Figure 1: Reporting Process Overview


Step 1: Calculate the facilities emissions for the calendar year.
Step 2: Do the emissions meet or exceed the reporting threshold?
NO
The facility is not required to report its emissions.
(The facility may choose to submit a report on a voluntary basis.)
YES
The facility is required to report its emissions.
Step 3: Complete the secure registration step.
User gains access to the reporting system.
Step 4: Complete the general Information about the company and facility.
Step 5: Complete the emissions data.
Do you wish to submit a confidentiality request?
YES
Step 6: Declare your intention to request confidentiality online.
Step 7: Prepare and attach your written request for confidentiality.
Step 8: Submit the emission report and the Statement of Certification online.
NO
Step 6: Submit the emission report and the Statement of Certification online.
Note: The deadline for submission of all required information including written requests for confidentiality is June 1st.

2 REPORTING CRITERIA

2.1 Reporting Threshold

The reporting threshold under the current GHG reporting requirements is 50 kilotonnes of CO_2 equivalent (50 kt CO_2 eq). A facility is required to submit a report if its total direct emissions of GHGs meet or exceed the reporting threshold. To complete this assessment, it is necessary for a facility to calculate its total emissions for the relevant calendar year for the GHGs and emission sources covered. Total emissions are calculated as the sum total mass of each of the gases or gas species multiplied by their respective global warming potential (GWP)—use Equation 1.

Emissions of individual species of hydrofluorcarbons (HFCs) and perfluorocarbons (PFCs) must be quantified separately and then multiplied by their GWPs. Only the emissions of HFCs, PFCs and sulphur hexafluoride (SF_6) that fall within the definitions of industrial processes and industrial product must be included in the calculations (see Section 4.3).

CO_2 emissions from biomass materials, as further discussed in Section 3.4, must **not** be included in the threshold calculation. However, if a report is required, CO_2 emissions from biomass combustion must be quantified and reported separately as part of the reportable GHG information (see Section 4). Methane (CH_4) and nitrous oxide (N_2O) emissions from biomass-related sources must be included in the reporting threshold calculation, and reported if a report is required.

Equation 1:

$$Total\ Emissions = \sum_{1}^{i}\left(E_{CO_2} \times GWP_{CO_2}\right)_i + \sum_{1}^{i}\left(E_{CH_4} \times GWP_{CH_4}\right)_i + \sum_{1}^{i}\left(E_{N_2O} \times GWP_{N_2O}\right)_i +$$
$$+ \sum_{1}^{i}\left(E_{PFC} \times GWP_{PFC}\right)_i + \sum_{1}^{i}\left(E_{HFC} \times GWP_{HFC}\right)_i + \sum_{1}^{i}\left(E_{SF_6} \times GWP_{SF_6}\right)_i$$

where:

E = total emissions of a particular gas or gas species from the facility (kt);

GWP = global warming potential of the same gas or gas species (see Section 2.2);

i = each emission source.

2.2 Greenhouse Gases Subject to Reporting

The GHGs that are subject to mandatory reporting are listed in Table 1. The Global Warming Potential (GWP) and Chemical Abstracts Service Registry Number (CAS Number) for each of these GHGs are also listed in the table.

Table 1: Greenhouse Gases and Gas Species Subject to Mandatory Reporting

Greenhouse Gas	Formula	CAS Number	100-year GWP*
Carbon dioxide	CO_2	124-38-9	1
Methane	CH_4	74-82-8	21
Nitrous oxide	N_2O	10024-97-2	310
Sulphur hexafluoride	SF_6	2551-62-4	23 900
Hydrofluorocarbons (HFCs):			
HFC-23 (trifluoromethane)	CHF_3	75-46-7	11 700
HFC-32 (difluoromethane)	CH_2F_2	75-10-5	650
HFC-41 (fluoromethane)	CH_3F	593-53-3	150
HFC-43-10mee 1,1,1,2,3,4,4,5,5,5-decafluoropentane)	$C_5H_2F_{10}$	138495-42-8	1 300
HFC-125 (pentafluoroethane)	C_2HF_5	354-33-6	2 800
HFC-134 (1,1,2,2-tetrafluoroethane)	$C_2H_2F_4$ (Structure: CHF_2CHF_2)	359-35-3	1 000
HFC-134a (1,1,1,2-tetrafluoroethane)	$C_2H_2F_4$ (Structure: CH_2FCF_3)	811-97-2	1 300
HFC-143 (1,1,2-trifluoroethane)	$C_2H_3F_3$ (Structure: CHF_2CH_2F)	430-66-0	300
HFC-143a (1,1,1-trifluoroethane)	$C_2H_3F_3$ (Structure: CF_3CH_3)	420-46-2	3 800
HFC-152a (1,1-difluoroethane)	$C_2H_4F_2$ (Structure: CH_3CHF_2)	75-37-6	140
HFC-227ea (1,1,1,2,3,3,3-heptafluoro-propane)	C_3HF_7	431-89-0	2 900
HFC-236fa (1,1,1,3,3,3-hexafluoro-propane)	$C_3H_2F_6$	690-39-1	6 300
HFC-245ca (1,1,2,2,3-pentafluoro-propane)	$C_3H_3F_5$	679-86-7	560
Perfluorocarbons (PFCs):			
Perfluoromethane (tetrafluoromethane)	CF_4	75-73-0	6 500
Perfluoroethane (hexafluoroethane)	C_2F_6	76-16-4	9 200
Perfluoropropane (octafluoropropane)	C_3F_8	76-19-7	7 000
Perfluorobutane (decafluorobutane)	C_4F_{10}	355-25-9	7 000
Perfluorocyclobutane (octafluoro-cyclo-butane)	c-C_4F_8	115-25-3	8 700
Perfluoropentane (dodecafluoro-pentane)	C_5F_{12}	678-26-2	7 500
Perfluorohexane (tetradecafluoro-hexane)	C_6F_{14}	355-42-0	7 400

* GWPs in Table 1 are from IPCC/OECD/IEA (1997).

3 BASIC CONCEPTS FOR REPORTING EMISSIONS

3.1 Relationship with UNFCCC and IPCC

The federal government, specifically Environment Canada, is responsible for developing and reporting a reliable, accurate and timely National Greenhouse Gas Inventory as part of its obligations under the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC is the first binding international legal instrument that deals directly with climate change.[1] To fulfill this obligation, Canada must report its national GHG emissions according to the comprehensive guidance provided by the UNFCCC, which includes reference to the following key technical documents:

- *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (IPCC/OECD/IEA, 1997);
- *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (IPCC, 2006)
- *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (IPCC, 2000); and
- *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (IPCC, 2003).

These documents were developed by the Intergovernmental Panel on Climate Change (IPCC).[2]

Under the GHG Emissions Reporting Program (GHGRP), currently no specific estimation methods are prescribed. Reporters can choose the quantification methodologies most appropriate for their own particular industry or application. However, reporting facilities must use methods for estimating emissions that are consistent with the guidelines adopted by the UNFCCC for the preparation of national GHG inventories, as discussed above.

The IPCC Guidelines and Good Practice Guidance[3] documents listed above describe various approaches to estimating GHG emissions at the national level, which can be applied at the facility level. These documents are available at the following link: www.ipcc-nggip.iges.or.jp/public/index.html

With the Government of Canada's commitment to reduce Canada's total GHG emissions by 17 percent

1 The UNFCCC was adopted at the June 1992 "Earth Summit" in Rio de Janeiro and has been in force since March 1994. The Convention's ultimate objective is the "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system" (United Nations, 1992).

2 The IPCC, established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, makes periodic assessments of the climate change issue and reports to governments as appropriate. It also provides scientific and technical advice to the Subsidiary Body for Scientific and Technological Advice to the UNFCCC.

3 The Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories consists of three volumes. The Reference Manual (Volume Three) contains information on GHG estimation methods. The 2006 IPCC Guidelines for National Greenhouse Gas Inventories consists of five volumes and includes new sources and gases as well as updates to previously published methods. The IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories (2000) and Good Practice Guidance for Land Use, Land-use Change and Forestry (2003) provide references that complement the IPCC Guidelines.

from 2005 levels by 2020, accurate tracking of GHG emissions, through the National GHG Inventory, is an important part of assessing Canada's overall environmental performance. By providing a more precise picture of the sources and amounts of GHG emissions from Canadian facilities, the GHGRP will contribute to the development, implementation and evaluation of climate change policies and strategies. The facility data collected through this program is published annually and is used to verify data presented in the National Greenhouse Gas Inventory Report.

3.2 Key Elements in Calculating Emissions

The following four methods are used to determine GHG emissions: monitoring and direct measurement, mass balance, emission factors, and engineering estimates.

The following key characteristics of the IPCC Guidelines and Good Practice Guidance documents are useful for reporters when calculating their facility's GHG emissions:

1. *The availability of a number of differing "tiers" of calculation methods*
   For various categories of emission sources, there are several ways of calculating the emissions, described as tiers (e.g. Tier 1, Tier 2, Tier 3), and each tier has an associated increasing level of detail and accuracy (e.g. a Tier 2 method is considered more accurate than a Tier 1 method).

2. *The use of specific emission factors or data*
   An emission factor is a value which outlines the relationship between an activity (e.g. fuel combustion) and the quantity of emissions associated with the activity. To evaluate GHG emissions, "default emission factors" are provided for many different fuels and activities. These default emission factors are considered to be less accurate than country-specific factors and even less accurate than process-specific factors. Reporters should use Canada-specific emission factors[4] or, better yet, industry-specific or technology-specific ones, where available. For example, the combustion of natural gas in a boiler results in emissions of GHGs such as CO_2, CH_4 and N_2O. Each has published emission factors which relate its emission rates to quantities of natural gas burned. To determine emissions, a facility would need to determine the total quantity of natural gas consumed during the calendar year (using billing records or meter reading) and multiply this quantity by the emission factor for each GHG. Environment Canada's Greenhouse Gas website (www.ec.gc.ca/ges-ghg) provides up-to-date Canada-specific emission factors and information to assist in quantifying emissions.

3. *A focus on the prioritization of effort*
   The IPCC suggests that the most effort on quantifying emissions should be spent on those sources that are the most critical— those that make up the largest quantity, are responsible for the greatest increase or decrease, or have the highest level of uncertainty associated with them.

Although comprehensive and rigorous, the IPCC Guidelines provide a flexible approach to GHG calculation procedures. The prioritization of emission sources of greatest importance is also emphasized. In prioritizing the work, these guidelines recognize that the more specific the emission factor or methodology (in terms of geography, facility or process), the better the emission estimate should be.

4 Environment Canada uses various emission factors that are specific to Canada for estimating emissions from several emission sources. For more details, see the latest National Greenhouse Gas Inventory Report. Reference details are provided in Appendix B.

3.3 Prioritizing Efforts

In the spirit of the IPCC Guidelines, reporters should prioritize their efforts when calculating their GHG emissions. This concept can be applied by identifying the emission sources of greatest significance at the facility and using a higher level of effort when calculating emissions from these sources. Since these emission sources have a greater impact on the totals, the use of more detailed methods would be appropriate. For example, for significant sources, efforts could be focused on using available facility- or process-specific emission factors or estimation methods, as opposed to general or default emission factors or estimation methods. Applying a lower level of effort (i.e. less detailed methods) to calculate emissions for less significant sources would minimize the impact on the overall total and its level of accuracy.

Since no absolute quantification standards are prescribed at this point, reporters can be flexible in their choice of emission calculation procedures. It is recognized that the approaches chosen will depend to a certain extent on the information available for the facility.

3.4 Biomass Emission Considerations

3.4.1 Combustion of Biomass

In accordance with UNFCCC and IPCC reporting guidelines, special consideration is necessary when reporting CO_2 emissions from biomass to ensure that there is no double counting. These guidelines, which the Government of Canada is bound to use, require the reporting (although not the counting) of CO_2 emissions resulting from the combustion of biomass materials. These emissions are not included in the national total, as it is assumed that the biomass is produced in a sustainable manner. That is, combusted biomass is replaced by growing biomass, which in turn reabsorbs the same amount of atmospheric carbon as was given off by the combusted material.[5]

In the same manner, reporters are required to report CO_2 emissions from biomass combustion. However, due to the assumption of sustainable harvesting, it is listed separately and is not included in the emission totals. This explicit reporting of CO_2 emissions from biomass-based combustion has the benefits of

- reminding reporters that these emissions need to be reported internationally;
- ensuring that CO_2 emissions from biomass are not counted in the totals; and
- demonstrating the quantity of atmospheric CO_2 loading that has been avoided.

On the other hand, as is required under the IPCC Guidelines, facilities must report **and** count methane (CH_4) and nitrous oxide (N_2O) emissions from biomass combustion. There is no reverse, biogenic mechanism by which replacement biomass removes these emissions from the atmosphere. Therefore, they must be included in the GHG totals in the same way as for CH_4 and N_2O emissions from any other material combusted.

It follows that CO_2 emissions from the *biomass portion* of waste that may be incinerated on site are to be

5 For information purposes in the National Greenhouse Gas Inventory, if biomass materials are harvested at an unsustainable rate, net CO_2 emissions are accounted for as a loss of biomass stocks in the Land Use, Land-Use Change and Forestry sector.

reported separately but are *not* counted in the emission totals. See Section 4.2.9 for more details.

3.4.2 Non-combustion of Biomass

Under the GHGRP, emissions from the decomposition of biomass in waste and wastewater must be reported. Reported and counted emissions are to include CH_4 and N_2O. Aerobic decomposition of waste can emit substantial quantities of CO_2, but these emissions need not be reported.

Reporting facilities will find additional details in Section 4.2.9 on how to handle emissions from biomass.

3.5 Auditing and Verification

Currently, there are no specific requirements for a facility to have its emissions verified by a third party. The information reported by a facility should be verifiable, which means that any information that would allow a facility's emissions to be verified by either the government or a third party certified by the government to carry out such verifications should be retained. Facilities can choose to have their emissions verified by a third party if they wish.

Reporters are required to keep copies of the requested information, together with any calculations, measurements and other data on which the information is based, at the facility to which it relates or at that facility's parent company, located in Canada. All information must be kept for a period of three years from the date the report must be submitted.

Reporters are also required to submit a Statement of Certification, signed by an authorized signing officer, stating that the information submitted is true, accurate and complete.

4 EMISSIONS REPORTING FORMATS

4.1 Reporting Emissions Data

An online reporting tool is available for reporting facilities to submit their GHG emissions information. To enter GHG emissions data, the reporter will input numerical values (in units of tonnes) for the emission sources occurring at the facility. The quantity of emissions in CO_2 equivalent units will be automatically calculated by the online reporting system.

A "not applicable" (N/A) box will be available for each emission source category and gas listed, and the reporter may select this box only in those cases where

- the emission source or emission type does not occur at the facility; or
- the emissions from a given source are not estimated due to the unavailability of data.

If a reporter has calculated the emissions for a given category or gas type and the emissions are zero, the reporter should enter the digit "0" in the relevant numeric field.

The reporting facility needs to calculate and report its direct emissions of the three gases CO_2, CH_4 and N_2O individually. When reporting these emissions, the reporter is required to disaggregate the emissions by the following source categories:

- Stationary Fuel Combustion
- Industrial Process
- Venting
- Flaring
- Fugitive
- On-site Transportation
- Waste
- Wastewater

The reporting facility also needs to calculate and report its direct emissions of HFCs, PFCs and SF_6 from industrial processes and industrial product use, by individual gas species. A graphical representation of the GHGs to be reported under the GHG Reporting Program (GHGRP) is presented in Table 2.

4.2 Carbon Dioxide, Methane and Nitrous Oxide Emissions

Carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are reported individually, by source category. Additional information on each of these categories is provided in the following subsections.

4.2.1 Stationary Fuel Combustion Emissions

Most facilities will have some form of stationary combustion. This category includes emissions from non-vehicular combustion sources occurring at the facility, where the fuel is burned for the purpose of producing energy (e.g. to generate electricity, heat or steam). It includes external (e.g. boilers, air handling units) and internal (e.g. emergency generators, cogeneration

Table 2: Greenhouse Gases to be Reported by Facilities

	Source Categories								
Gas	Stationary Fuel Combustion	Industrial Process	Venting	Flaring	Fugitive	On-site Transporation	Waste	Wastewater	Gas Total
CO_2[1]	•	•	•	•	•	•	•	•	❑
CH_4	•	•	•	•	•	•	•	•	❑
N_2O	•	•	•	•	•	•	•	•	❑
HFCs[2]		•							❑
PFCs[2]		•							❑
SF_6[3]		•							❑
Facility Total									❑

Notes:
1. CO_2 from biomass combustion is collected but not included in the facility total or threshold calculations.
2. Total for each species identifed from industrial processes and industrial product use.
3. Total from industrial process and industrial product use.

• to be reported
❑ to be published

turbines) combustion sources. On-site waste incineration is also included if the waste is combusted for energy. Emissions from waste incineration used as a disposal method are included under the Waste Emissions category (see Section 4.2.7). Special consideration is needed for CO_2 emissions from the combustion of biomass (see Section 4.2.9).

4.2.2 Industrial Process Emissions

This category refers to emissions from an industrial process involving chemical or physical reactions other than combustion and where the primary purpose of the industrial process is not energy production. Examples of industrial processes that represent sources of this category of emissions include mineral production (e.g. cement, lime), metal production (e.g. iron and steel, aluminium) and chemical production (e.g. adipic acid, nitric acid).

This category of emissions is expected to be more unique to specific sectors and to specific facilities in a given sector, depending on the operations performed at the facility.

Note: In instances where industrial process emissions are produced in combination with emissions from fuel combusted for energy purposes, the emissions are to be categorized according to the purpose of the activity. If the purpose of the activity is energy production, the emissions are included under Stationary Fuel Combustion Emissions. However, if the purpose of the activity is an industrial process rather than energy production, the emissions are included under Industrial Process Emissions. The reduction of iron in a blast furnace through the oxidation of coke is an example. Invariably, the heat released is used within the process

or for other energy needs; however, in this case, since the primary purpose of coke oxidation is to produce pig iron, the emissions are categorized as Industrial Process Emissions.[6]

4.2.3 Venting Emissions

Venting emissions are defined as the controlled releases to the atmosphere of a waste gas. These include, but are not limited to, releases of casing gas, a gas associated with a liquid (or solution gas), treater, stabilizer or dehydrator off-gas, blanket gas and releases from pneumatic devices which use natural gas as a driver, and from compressor start-ups, pipelines and other blowdowns, and metering and regulation station control loops.

In general, venting emissions are a result of the handling or processing of fuel in the fossil fuel industries.

4.2.4 Flaring Emissions

Flaring emissions are defined as controlled releases of gases from industrial activities from the combustion of a gas and/or liquid stream produced at the facility not for the purpose of producing energy. They may arise from waste petroleum incineration, hazardous emission prevention systems (whether in pilot or active mode), well testing, natural gas gathering systems, natural gas processing plant operations, crude oil production, pipeline operations, petroleum refining as well as chemical fertilizer and steel production.

In general, flaring emissions are a result of the handling or processing of fuel in the fossil fuel industries.

Note: Flaring of landfill gas should be accounted for under the Waste Emissions category (see Section 4.2.7).

4.2.5 Fugitive Emissions

Fugitive emissions are defined as uncontrolled releases of gases from industrial activities, other than releases that are Venting Emissions or Flaring Emissions described above. In the case of fossil fuel industries, fugitive emissions include releases resulting from the production, processing, transmission, storage and use of solid, liquid or gaseous fuels. Examples include leakage from natural gas transmission lines and processing plants, accidental releases from oil and gas wells, and releases from the mining and handling of coal.

4.2.6 On-site Transportation Emissions

This category refers to any direct releases of CO_2, CH_4 and N_2O resulting from fuel combustion in machinery used for the on-site (i.e. at the facility) transportation of substances, materials or products used in the production process. Examples of such activities may include:

- equipment used at a steel mill to move molten metal to different stages in the steel production process;
- equipment used at oil sands operations to mine and/or move oil sand or other materials to subsequent on-site processes (e.g. crushing, extraction); and
- equipment used at above- or below-ground mining operations to mine and/or move mined materials or other intermediate products or materials to different on-site production processes.

6 This distinction is in accordance with that provided in Volume 1, Reporting Instructions, of IPCC/OECD/IEA (1997: p. 2.1).

4.2.7 Waste Emissions

This category of emissions refers to releases that result from waste disposal sources at a facility. This includes landfilling of solid waste, flaring of landfill gas and waste incineration. GHG emissions from waste-to-energy conversion, where waste material is used directly as fuel or converted into fuel, must be calculated and reported under Stationary Fuel Combustion Emissions. There are emissions of CO_2, CH_4 and N_2O from waste disposal, and special consideration is necessary for CO_2 emissions originating from biomass materials in waste (see Section 4.2.9).

4.2.8 Wastewater Emissions

This category of emissions refers to releases that result from wastewater and wastewater treatment at a facility. Wastewater treatment processes (aerobic and anaerobic) typically result in emissions of CH_4 and N_2O and these emissions are reported under this category. CO_2 is also a product of aerobic and anaerobic wastewater treatment. However, as described in Section 4.2.9, these emissions should not be reported.

In general, closed underground sewers are not considered a significant source of CH_4 or N_2O.

GHG emissions from wastewater treatment plants or processes will vary based on the type of influent (municipal vs. industrial wastewater), volume of influent, and the specific treatment processes used. If CH_4 from an anaerobic digestion process is collected and combusted for energy, it should be reported under Stationary Fuel Combustion Emissions. Advanced treatment plants with nutrient removal (i.e. nitrification and denitrification) represent a small but distinct source of N_2O.

Much of the N_2O which leaves a wastewater treatment plant in the liquid effluent stream is eventually released to the atmosphere and does represent a significant source of GHGs but wastewater treatment facilities are not required to report this type of delayed-flux emission from effluent.

4.2.9 CO_2 Emissions from Biomass

(i) CO_2 Emissions from Combustion of Biomass

The facility may use biomass materials as a fuel source in its on-site combustion processes. The reporting facility should report the CO_2 emissions from the combustion of biomass fuels, but these should not be included in the emission totals for the facility. The emissions of CH_4 and N_2O resulting from biomass combustion must be included in the facility totals.

Similarly, for waste incineration processes that may occur at the facility, the waste stream may be composed of organic (or biomass) materials and fossil fuel-based carbon materials (e.g. plastics, rubber, liquid solvents, waste oil). The CO_2 emissions from the biomass portion being incinerated should be reported separately in the GHG report (and not included in the CO_2 emission totals), whereas the CO_2 emissions resulting from incineration of the fossil fuel-based fraction must be included in the facility totals.

As a further example of combustion of biomass materials, in the case of flaring of landfill gas, the CO_2 emissions produced from this combustion process should be reported separately in the reporting tool, and not included in the emission totals, since landfill gas is

considered a biomass material. However, the CH_4 and N_2O emissions from this process must be included in the emission totals and reported under the Waste Emissions category.

(ii) CO_2 Emissions from Non-combustion of Biomass

Waste disposal and wastewater treatment processes can produce CO_2 emissions, a result of aerobic decomposition of biomass material in the waste or waste water stream. The reporter is not required to report these CO_2 emissions, however emissions of CH_4 and N_2O resulting from decomposition must be reported.

4.3 Hydrofluorocarbon, Perfluorocarbon and Sulphur Hexafluoride Emissions

The reporting facility also needs to calculate and report its direct emissions of the hydrofluorocarbon (HFC) and perfluorocarbon (PFC) gas species listed in Table 1, and the gas sulphur hexafluoride (SF_6), if the facility emits these GHGs from industrial processes and industrial product use.

HFC, PFC and SF_6 emissions from **industrial processes** are described as emissions resulting from a chemical or physical transforming of material, such as HFCs and PFCs used as foam blowing agents and PFC emissions from anode effects in primary aluminium smelting.

Industrial product use means the use of a product for an industrial process that does not react in the process, such as SF_6 and HFCs used in the magnesium industry as a cover gas. Use of SF_6 in electrical equipment (e.g. gas-insulated switchgears, circuit breakers) is also considered an industrial product use.

The following subsections provide additional detail on these GHGs and possible sources of such emissions.

4.3.1 Hydrofluorocarbons

(i) Overview

HFCs are a series of synthetic gases containing carbon, hydrogen and fluorine (see Table 1 for a listing of individual HFC species). While HFCs are emitted in small quantities, they have disproportionate effects as a result of long atmospheric lifetimes, which in turn lead to large GWPs. The HFC species have 100-year GWPs ranging from 140 to as high as 11 700. The use of HFCs is expected to grow substantially as a result of the phasing out of various ozone depleting substances (IPCC/OECD/IEA, 1997). HFCs are not included under the Montreal Protocol because they are not considered to be ozone depleting substances.

(ii) Sources

The main sources of HFC emissions from industrial processes and industrial product use include emissions arising from foam blowing and the use of HFCs as a cover gas in metal production.

Emissions of HFCs from other applications, such as refrigeration, air conditioning, propellants in aerosols, fire extinguishers and solvents, are not considered industrial process or industrial product use emissions under the GHGRP and therefore should not be reported.

4.3.2 Perfluorocarbons

(i) Overview

PFCs are a family of industrial gases, and they should be reported by individual PFC gas species

(see Table 1). Emissions of PFCs are relatively low by mass; however, they are potent GHGs, with 100-year GWPs ranging between 6 500 and 9 200. PFCs are not ozone-depleting substances, so they are not included under the Montreal Protocol (IPCC/OECD/IEA, 1997).

(ii) Sources

The main sources of PFC emissions from industrial processes and industrial product use are attributed to two areas—aluminium production and foam blowing. PFC emissions are an undesirable by-product of aluminium production, while PFCs are purchased and used as foam blowing agents.

Emissions of PFCs from other applications, such as refrigeration, air conditioning, semiconductor manufacturing, solvents, aerosols and fire extinguishing, are not considered industrial process or industrial product use emissions under the GHGRP and therefore should not be reported.

4.3.3 Sulphur Hexafluoride

(i) Overview

SF_6 is a synthetic gas with chemical properties that render it relatively inert, which makes it a preferred choice in various industrial applications. It is a particularly potent GHG, with a 100-year GWP of 23 900 and an estimated lifetime of about 3 200 years (IPCC/OECD/IEA, 1997).

(ii) Sources

The main sources of SF_6 emissions from industrial processes and industrial product use include SF_6 used as a cover gas in magnesium smelting and casting as well as for special foundry products in the aluminium industry. Use of SF_6 as an insulating gas in electrical equipment (e.g. gas-insulated switchgear, circuit breakers) is also considered as an industrial product use.

Emissions of SF_6 from other applications, such as fire suppression and explosion protection, leak detection and various electronic applications, are not considered industrial process or industrial product use emissions under the GHGRP and therefore should not be reported.

4.4 Estimation Methods

The reporting facility must identify and report the type of estimation method or methods used to determine the quantities of emissions reported. Such methods include monitoring or direct measurement, mass balance, emission factors and engineering estimates. These are defined below.

Monitoring or Direct Measurement:

This type of method may involve continuous emission monitoring systems (CEMS) (emissions recorded over an extended and uninterrupted period), predictive emission monitoring (correlations developed between measured emission rates and process parameters) or source testing (e.g. stack sampling).

Mass Balance:

This type of method involves the application of the law of conservation of mass to a facility, process or piece of equipment. Emissions are determined from the difference in the input and output of a unit operation where the accumulation and depletion of a substance are included in the calculations.

Emission Factors:

This method uses emission factors (EF) to estimate the rate at which a pollutant is released into the atmosphere (or captured) as a result of some process activity or unit throughput. The EFs used may be average or general EFs, or technology-specific EFs.

Engineering Estimates:

This type of method may involve estimating emissions based on engineering principles and judgment, using knowledge of the chemical and physical processes involved, the design features of the source, and an understanding of the applicable physical and chemical laws.

Reporters are reminded of the legal requirement to keep copies of the information submitted, together with any calculations, measurements and other data on which the information is based, for a minimum period of three years from the date the information must be submitted.

Currently, there are no specific protocols to define how reporters must calculate their GHG emissions. However, reporters must use methods that are consistent with the methodologies approved by the UNFCCC and developed by the IPCC. Refer to sections 3.1–3.4 for background information and a more complete description of the flexibility allotted to reporters in their estimation procedures. For further details on the IPCC methodologies, reporters should refer to Table 3, which presents specific references to the relevant sections of the IPCC Guidelines and the Good Practice Guidance documents for the emission sources subject to reporting (these documents are available at the following link: www.ipcc-nggip.iges.or.jp/public/index.html).

Table 3: Reference to Methodological Guidance in the IPCC Guidelines and Good Practice Guidance Documents, by Emission Source

Emission Source Category	2006 IPCC Guidelines	Revised 1996 IPCC Guidelines – Reference Manual (Volume 3)	Good Practice Guidance 2000
CO_2, CH_4, N_2O			
Stationary Fuel Combustion	Volume 2 (Energy), Chapter 2 (Stationary Combustion), pages 2.1–2.47	Energy chapter (Chapter 1), pages 1.1–1.62	Energy chapter (Chapter 2), pages 2.1–2.43
Industrial Process	Volume 3 (Industrial Process and Product Use), Chapters 1–8	Industrial Process chapter (Chapter 2), pages 2.1–2.42	Industrial Process chapter (Chapter 3), pages 3.9–3.38
Venting	Volume 2 (Energy), Chapter 4 (Fugitive Emissions), pages 2.1–2.47	Energy chapter (Chapter 1), pages 1.99–1.131	Energy chapter (Chapter 2) pages 2.70–2.93
Flaring	Volume 2 (Energy), Chapter 4 (Fugitive Emissions), pages 2.1–2.47	Energy chapter (Chapter 1), pages 1.99–1.131	Energy chapter (Chapter 2), pages 2.70–2.93
Fugitive	Volume 2 (Energy), Chapter 4 (Fugitive Emissions), pages 2.1–2.47	Energy chapter (Chapter 1), pages 1.99–1.131	Energy chapter (Chapter 2), pages 2.70–2.93
Waste	Volume 5 (Waste), Chapters 1–5	Waste chapter (Chapter 6), pages 6.1–6.32	Waste chapter (Chapter 5), pages 5.5–5.31
Wastewater	Volume 5 (Waste), Chapter 6 (Wastewater Treatment and Discharge), pages 6.1–6.28	Waste chapter (Chapter 6), pages 6.1–6.32	Waste chapter (Chapter 5), pages 5.5–5.31
On-site Transportation	Volume 2 (Energy), Chapter 3 (Mobile Combustion), pages 3.1–3.78	Energy chapter (Chapter 1), pages 1.1–1.62	Energy chapter (Chapter 2), pages 2.44–2.50
HFCs, PFCs, SF_6			
HFCs	Various chapters, including: • Volume 3 (Industrial Process and Product Use), Chapter 3 (Chemical Industry Emissions), pages 3.70–3.94 • Volume 3 (Industrial Process and Product Use), Chapter 7 (Emissions of Fluorinated Substitutes for Ozone Depleting Substances), pages 7.1–7.71	Industrial Process chapter (Chapter 2), pages 2.1–2.3, 2.42–2.62	Industrial Process chapter (Chapter 3), pages 3.69–3.130
PFCs	Various chapters, including: • Volume 3 (Industrial Process and Product Use), Chapter 4 (Metal Industry Emissions), pages 4.1–4.85 • Volume 3 (Industrial Process and Product Use), Chapter 7 (Emissions of Fluorinated Substitutes for Ozone Depleting Substances), pages 7.1–7.71 Volume 3 (Industrial Process and Product Use), Chapter 8 (Other Product Manufacture and Use), pages 8.1–8.43	Industrial Process chapter (Chapter 2), pages 2.1–2.3, 2.34–2.37, 2.42–2.62	Industrial Process chapter (Chapter 3), pages 3.39–3.47, 3.69–3.130
SF_6	Various chapters, including: • Volume 3 (Industrial Process and Product Use), Chapter 4 (Metal Industry Emissions), pages 4.1–4.85 • Volume 3 (Industrial Process and Product Use), Chapter 8 (Other Product Manufacture and Use), pages 8.1–8.43	Industrial Process chapter (Chapter 2), pages 2.38–2.39, 2.60–2.63	Industrial Process chapter (Chapter 3), pages 3.48–3.78

APPENDIX A: Frequently Asked Questions

Quick Reference

General

Page 21	Q1	How many facilities will be affected by mandatory greenhouse gas (GHG) reporting? What sort of facilities are these?
Page 21	Q2	What constitutes 50 kt of CO_2 eq?
Page 21	Q3	The reporting threshold under Environment Canada's GHG Emissions Reporting Program is 50 kilotonnes (kt) or more of GHG emissions, in CO_2 equivalent units. What are the reporting thresholds in other Canadian jurisdictions?
Page 21	Q4	Are landfills and incinerators included in the mandatory GHG reporting requirements for emissions?
Page 22	Q5	When can I submit the required information for this year's emissions? Can I send the information before June 1st?
Page 22	Q6	Will the reported data be verified for accuracy?
Page 22	Q7	Are there penalties for not reporting, late submission or faulty reporting?
Page 22	Q8	Who must report emissions if the facility underwent a change of operator during the calendar year?
Page 22	Q9	Do emissions need to be reported if a facility closed during the calendar year?
Page 22	Q10	If the parent company of a facility is not Canadian, does the facility need to report?
Page 23	Q11	Will you be offering any type of training sessions and/or workshops for GHG reporters?
Page 23	Q12	What is the D-U-N-S number?
Page 23	Q13	What is a Statement of Certification?
Page 23	Q14	Who must sign the Statement of Certification on behalf of a reporting facility?
Page 23	Q15	Since the *Canada Gazette* notice on reporting requirements does not indicate any specific mandatory protocol or methodology for estimation or quantification of GHG emissions, what is the need for a "Statement of Certification" by an officer of the reporting facility?
Page 24	Q16	What are the requirements for the retention of records?
Page 24	Q17	Will I receive any feedback on my report?

Technical Information

Page 24	Q18	How are greenhouse gas emissions calculated by reporting facilities?
Page 24	Q19	Will any guidelines be issued on the estimation of GHG emissions for the reporting year?
Page 25	Q20	If a reporting emitter adopts estimation or quantification protocols for future years that are different from those used in Phase 1 and if the resulting estimates of emissions differ significantly, how will the differing results be handled?
Page 25	Q21	When reporting GHG emissions, is the requirement to report as a CO_2 equivalent or actual tonnage of each gas? For example, would I report 100 tonnes of N_2O or 31 000 tonnes of CO_2 equivalent units for N_2O?
Page 25	Q22	Why does the pipeline definition refer to "pipeline transportation system" while the definition used for other emissions-reporting purposes in the National Pollutant Release Inventory (NPRI) refers to "pipeline installation"?
Page 25	Q23	I have a facility that is a pipeline transportation system. What should I enter as the location of this facility?
Page 26	Q24	What should be entered as the location of an offshore installation?

Page 26	Q25	How does the presence on site of a cogeneration unit influence emissions reporting? What if I am not the operator of the cogeneration unit?
Page 26	Q26	Do emissions related to space heaters need to be reported?
Page 26	Q27	Am I required to report emissions from the combustion of biomass?
Page 27	Q28	If most of the CO_2 emissions from my facility are from the burning/combustion of natural gas in the boilers and furnaces, do they count as "CO_2 emissions from the combustion of biomass"?
Page 27	Q29	How are emissions from electricity consumption reported by a facility?
Page 27	Q30	Where should CO_2 emissions from natural gas sweetening be reported in terms of categorization?
Page 27	Q31	Do I need to report transportation emissions?
Page 27	Q32	How do I submit my GHG information to Environment Canada?

Publication and Confidentiality of Data

Page 28	Q33	What is this facility-level data used for? Is it part of the data for Canada's National Greenhouse Gas Inventory that is submitted annually to the United Nations?
Page 28	Q34	Will the information I provide to Environment Canada be kept confidential?
Page 28	Q35	Some industries might be concerned that releasing their GHG emissions data to the public could affect their competitive position. How have you addressed those concerns in the reporting system?
Page 29	Q36	Who will have access to information reported?
Page 29	Q37	How do I request that my submission be treated as confidential?
Page 29	Q38	If a reporter is granted confidentiality in the first reporting year, must that reporter submit a confidentiality request every year thereafter?
Page 29	Q39	Is there an appeal process if a reporter has not been granted confidentiality? If so, what is the timeline to submit the appeal?

GENERAL

Q1 *How many facilities will be affected by mandatory greenhouse gas (GHG) reporting? What sort of facilities are these?*

Only those facilities that emit the equivalent of 50 000 tonnes (50 kt) or more of carbon dioxide (in CO_2 equivalent units, or CO_2 eq) per year are required to report. This threshold is expected to apply to over 500 facilities across Canada, in all sectors. Facilities that do not meet the reporting threshold are encouraged to report voluntarily.

Major industrial facilities that produce electricity, heat or steam on site using fossil fuels are those that would typically emit more than 50 kt of GHGs per year. These could include power generation facilities, integrated steel mills, facilities involved in smelting and refining metals, petroleum refineries and chemical production facilities. Other operations, such as large landfills and incinerators, could also be subject to this mandatory reporting.

Q2 *What constitutes 50 kt of CO_2 eq?*

The following examples are given to provide context for the magnitude of this threshold. See Section 4 for further information regarding how to quantify your emissions.

- A commercial or institutional facility combusting natural gas for heat or process use in furnaces or boilers with a combined maximum heat input of 115 million kilojoules/hr (109 million BTU/hr), operating at full capacity, 24 hours per day, 7 days per week for one year would meet the threshold.
- The production of 17 159 tonnes of nitric acid in a "Type 1" dual-pressure plant with extended absorption would meet the threshold.
- The production of 32 051 tonnes of ammonia using the natural gas reforming process to produce hydrogen would meet the threshold.
- The combustion of 17.9 million litres of diesel fuel in one year in stationary sources such as diesel generators would meet the threshold.

Q3 *The reporting threshold under Environment Canada's GHG Emissions Reporting Program is 50 kilotonnes (kt) or more of GHG emissions, in CO_2 equivalent units. What are the reporting thresholds in other Canadian jurisdictions?*

A number of provinces have greenhouse gas reporting programs, each specifying their own reporting requirements, including reporting thresholds. For example, the reporting threshold for Alberta is set at 50kt, Ontario at 25kt, and British Columbia, Quebec and Nova Scotia are at 10kt. It is the facility's responsibility to understand the various GHG reporting obligations and to determine whether a GHG report is required to be submitted to the federal and/or provincial jurisdictions.

Q4 *Are landfills and incinerators included in the mandatory GHG reporting requirements for emissions?*

Any facility that emits more than 50 kt of CO_2 eq in the calendar year must report. Landfills and incinerators fall within the definition of "facility." (See the Waste category in Section 4.2.7 for details).

Q5 ***When can I submit the required information for this year's emissions? Can I send the information before June 1st?***

The information will be collected electronically through Environment Canada's Single Window system. The system is expected to be ready to collect data submissions by the spring. Reporters will therefore be able to access the reporting system early and submit their information well in advance of the June 1st reporting deadline. Details regarding the online reporting tool are available on Environment Canada's GHG website (www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=F3E7B38E-1).

Q6 ***Will the reported data be verified for accuracy?***

Facilities must ensure that the data they submit is accurate. Reporters are required to submit a Statement of Certification, signed by an authorized official, stating that the information contained in the attached emission report is true, accurate and complete.

Reporters also have a legal obligation to keep copies of the information submitted, along with any calculations, measurements and other data on which the information is based. All information must be kept for a period of three years from the date the information was reported to Environment Canada.

Environment Canada reviews the submitted information and conducts a number of checks for compliance purposes and for completeness. Clarifications may be sought from individual facilities where necessary.

Q7 ***Are there penalties for not reporting, late submission or faulty reporting?***

All persons who operate a facility that is subject to the GHG reporting requirements outlined in the *Canada Gazette* notice under the authority of the *Canadian Environmental Protection Act, 1999* (CEPA 1999) are legally obligated to provide whatever information is required by the notice. Any person in contravention of CEPA 1999 by failing to report, late submission or faulty reporting will be referred to enforcement staff and may be subject to enforcement action. Further information on enforcement and compliance under CEPA 1999 can be found online at: http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=Fr&n=66B8D849-1

Q8 ***Who must report emissions if the facility underwent a change of operator during the calendar year?***

If the person who operates the facility that is subject to reporting changes during the calendar year, the person who operates the facility as of December 31st, must report for the entire calendar year.

Q9 ***Do emissions need to be reported if a facility closed during the calendar year?***

If operations at a facility are terminated in any calendar year, the last operator of that facility is required to report for the portion of the calendar year during which the facility was in operation (if the facility emissions meet the reporting threshold requirement). The last operator should inform the Pollutant Inventories and Reporting Division of the status of the facility to avoid further follow-up.

Q10 ***If the parent company of a facility is not Canadian, does the facility need to report?***

If the facility is located in Canada and exceeds the reporting threshold, then the operator is required to submit a report for the facility. The operator would not, however, be required to provide parent company information if there is no Canadian parent company.

Q11 *Will you be offering any type of training sessions and/or workshops for GHG reporters?*

Environment Canada's GHG website (www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=F3E7B38E-1) offers guidance on the reporting requirements and the online reporting tool.

Q12 *What is the D-U-N-S number?*

D-U-N-S numbers are unique nine-digit identification sequences that provide unique identifiers of single business entities while linking corporate family structures together. The internationally recognized numbering system is developed and maintained by the private firm of D&B (formerly Dun and Bradstreet).

D&B links the D-U-N-S numbers of parents, subsidiaries, headquarters and branches of more than 62 million corporate family members around the world. Used by the world's most influential standards-setting organizations, the D-U-N-S number is recognized, recommended and/or required by more than 50 global, industry and trade associations, including the United Nations, the U.S. federal government, the Australian government and the European Commission.

If a facility or company does not have a D-U-N-S number, it is not required to get one in order to submit an emissions report.

Q13 *What is a Statement of Certification?*

A Statement of Certification is a statement or confirmation signed by an authorized signing officer of the reporting company, indicating that the information submitted in response to the GHG reporting requirements is true, accurate and complete.

Q14 *Who must sign the Statement of Certification on behalf of a reporting facility?*

The reporting facility may designate anyone within its organization to sign, provided that the individual has delegated powers to accept legal responsibility for the information provided and is in a position to knowledgeably attest to the completeness and accuracy of the submitted report. Facilities may, for example, designate the chief executive officer, the environmental coordinator or the plant manager to certify the report. The authorized signing officer must certify the GHG emissions report electronically at the time of report submission through the online reporting tool.

Q15 *Since the Canada Gazette notice on reporting requirements does not indicate any specific mandatory protocol or methodology for estimation or quantification of GHG emissions, what is the need for a "Statement of Certification" by an officer of the reporting facility?*

There are two important reasons for the required certification:

1. To provide assurance, from a suitable representative of the reporting facility, that the facility has complied with the reporting requirements. In signing, the officer is attesting that:
   - he/she has reviewed the submitted report and any supporting documents;
   - he/she has exercised due diligence to ensure that the information provided is true and complete; and
   - to the best of the signing officer's knowledge, the amounts and values provided in the report are accurate, based on reasonable estimates using available data and quantification methodology chosen by the reporting facility.
2. To provide a reasonable degree of openness, transparency and visible accountability in the reporting process and, in so doing, to ensure a high degree of public and stakeholder confidence in the integrity of the reporting system and the results obtained.

Q16 *What are the requirements for the retention of records?*

The *Canada Gazette* notice indicates that records must be maintained for a period of three years from the date the information must be submitted.

Q17 *Will I receive any feedback on my report?*

Individual feedback to reporters will not normally be provided (unless clarification is needed on specific information that was reported). However, appropriate government authorities will respond to specific requests for information.

For questions about the GHG Emissions Reporting Program, please contact:

Pollutant Inventories and Reporting Division, Environment Canada
Fontaine Building, 8th Floor
200 Sacré-Coeur Boulevard
Gatineau QC K1A 0H3
Telephone: 819-994-0684 or toll-free at 1-877-877-8375
Fax: 819-953-2347
Email: ges-ghg@ec.gc.ca

For assistance with Government of Alberta GHG reporting requirements, please contact the Alberta Environment GHG Program at aenv.ghg@gov.ab.ca, or the Alberta Environment Climate Change policy unit at 780-427-5200.

For assistance with the Government of British Columbia GHG reporting requirements, please contact the British Columbia Ministry of Environment at GHGReporting@gov.bc.ca or Dennis.Paradine@gov.bc.ca.

For assistance with the Government of Ontario GHG reporting requirements, please contact the Ontario Ministry of Environment at GHGReporting@ontario.ca.

TECHNICAL INFORMATION

Q18 *How are greenhouse gas emissions calculated by reporting facilities?*

There are a number of methods that a facility may choose to use to calculate its GHG emissions. These include monitoring and direct measurement, mass balance, emissions factors, and engineering estimates. Reporting facilities must use methods for estimating emissions that are consistent with the guidelines adopted by the United Nations Framework Convention on Climate Change and developed by the Intergovernmental Panel on Climate Change (see Section 4.4).

Q19 *Will any guidelines be issued on the estimation of GHG emissions for the reporting year?*

No, there will be no specific protocols developed for estimating GHG emissions; however guidance is provided to assist reporters in categorizing emissions and in using the United Nations Framework Convention on Climate Change guidelines. This technical guidance document is designed to help potential reporters determine if they are required to submit a report. It also includes technical information related to GHG emissions to be reported and the required reporting format.

Q20 *If a reporting emitter adopts estimation or quantification protocols for future years that are different from those used in Phase 1 and if the resulting estimates of emissions differ significantly, how will the differing results be handled?*

The purpose behind the phased approach to the development of the full domestic reporting system is to develop, test, assess and refine all aspects of reporting, including estimation and quantification protocols and methodologies. Until suitable methodologies and protocols are finalized, variations in results can be expected if there are changes in selected methodologies from one year to the next. It is important to recall that, as per the *Canada Gazette* notice, reporters must keep copies of the required information, together with any calculations, measurements and other data on which the information is based.

Q21 *When reporting GHG emissions, is the requirement to report as a CO_2 equivalent or actual tonnage of each gas? For example, would I report 100 tonnes of N_2O or 31 000 tonnes of CO_2 equivalent units for N_2O?*

The reporter will be required to report the emissions of each individual GHG type, expressed in units of tonnes for each. For the example listed above, the reporter would report 100 tonnes of N_2O.

Please note, however, that when a potential reporter is assessing whether he/she needs to submit a report, he/she will need to convert the emissions to CO_2 equivalent units (CO_2 eq) to compare them with the reporting threshold. The carbon dioxide equivalent (CO_2 eq) value is how much CO_2 would be required to produce a similar warming effect and it is calculated by multiplying the amount of the gas by an associated global warming potential (GWP). See Section 2.2 for a complete list of the global warming potential for each greenhouse gas.

If the facility meets or exceeds the reporting threshold of 50 kt of CO_2 eq for this year, emissions for that facility must be reported.

Q22 *Why does the pipeline definition refer to "pipeline transportation system" while the definition used for other emissions-reporting purposes in the National Pollutant Release Inventory (NPRI) refers to "pipeline installation"?*

A pipeline is considered a mode of transport. For GHG reporting purposes, the concern is with both point source emissions associated with stationary combustion sources such as compressors at pipeline installations as well as **fugitive** emissions along the length of the entire pipeline system. A natural gas transmission company that has several pipeline operations or networks within and across several provinces should use the provincial boundaries to identify its "pipeline transportation systems" and then report GHG emissions for each discrete system.

Q23 *I have a facility that is a pipeline transportation system. What should I enter as the location of this facility?*

The location of a pipeline transportation system can be defined as the location of the largest unit in the system. Alternatively, you could define the location of the facility as the point where the boundary coincides with the point of entry or start of the pipeline system. A description of the extent of the pipeline system and an indication of nearby cities or towns would also be helpful in locating such a facility. Once a location has been selected for the first year of reporting, it is important that it be kept constant in subsequent years (unless it no longer applies for some reason). Similarly, the explanations above apply to facilities other than pipeline transportation systems that are spread out over large areas.

Q24 *What should be entered as the location of an offshore installation?*

Offshore installations must be specified using longitudinal and latitudinal coordinates.

Q25 *How does the presence on site of a cogeneration unit influence emissions reporting? What if I am not the operator of the cogeneration unit?*

If there is a cogeneration unit located on site at your facility and it generates direct GHG emissions, these emissions are to be reported. The emissions are to be categorized under Stationary Fuel Combustion, since cogeneration units produce energy (typically of at least two forms). Total direct GHG emissions must be reported, even if some of the resultant energy is exported off site. If the operator of the cogeneration unit is different from the operator of the overall facility, a separate report must be submitted by the operator of the cogeneration unit (if the reporting threshold is reached).

Q26 *Do emissions related to space heaters need to be reported?*

Yes, reporters are required to include emissions from space heaters utilizing combustion (i.e. burning fuel), and these emissions are to be included as part of the total under the Stationary Fuel Combustion category (unless the fuel burned is a biomass material, in which case special consideration is necessary for the CO_2 emissions—see Section 4.2.9).

Q27 *Am I required to report emissions from the combustion of biomass?*

Yes, it is necessary to calculate and report the quantity of emissions of CH_4 and N_2O from the combustion of biomass materials. This includes emissions resulting from biomass burned for any purpose except land clearing (see note below). The CO_2 emissions from biomass combustion must be calculated and reported separately in the reporting tool. These CO_2 emissions should not be included as part of the total emissions from the facility. However, the CH_4 and N_2O emissions are to be included in the emission totals. The following materials are considered to be biomass materials:

- plants or plant materials, animal waste or any product made of either of these;
- wood and wood products, charcoal and agricultural residues and wastes (including organic matter such as trees, crops, grasses, tree litter, or roots);
- that portion of biologically derived organic matter in municipal and industrial wastes (this would include wastewater treatment sludge from pulp and paper plants). It is important to note that only the biomass portion of industrial or municipal waste should be included in this category. If the portion derived from fossil fuels is combusted, the emissions from this portion must follow the rules for non-biomass based sources;
- bio-alcohols;
- black liquor;
- landfill gas;
- sludge gas; and
- animal or plant-derived oils.

Note: Occasionally, tree stumps, branches, twigs and leaves are burned on site as land is cleared. The GHGs emitted (CO_2, CH_4 and N_2O) from this activity should not be reported.

Q28 *If most of the CO_2 emissions from my facility are from the burning/ combustion of natural gas in the boilers and furnaces, do they count as "CO_2 emissions from the combustion of biomass"?*

Standard commercial natural gas is a fossil fuel and hence does not fall into the category of biomass fuels. Thus, all GHG emissions from the combustion of commercial natural gas (e.g. CO_2, CH_4 and N_2O) must be reported and counted in emission totals or when assessing whether a facility meets the reporting threshold.

Only specialized, biomass-derived gas (e.g. CH_4 produced from a digester or landfill and usually used on site) would be considered a biomass fuel. (CO_2 emissions from the combustion of biomass materials are not included in Stationary Fuel Combustion totals, as it is assumed that the biomass is produced in a sustainable manner).

Q29 *How are emissions from electricity consumption reported by a facility?*

Reporters are required to report on direct GHG emissions only from sources occurring at the facility. For electricity that may be generated on site, total GHG emissions resulting from the generation of this electricity should be reported even if some of the resultant electricity is exported off site.

The indirect emissions associated with the import of electricity (not generated on site) should not be reported.

Q30 *Where should CO_2 emissions from natural gas sweetening be reported in terms of categorization?*

CO_2 released as a result of processing, such as the sweetening of natural gas, should be reported in the Venting Emissions category.

Q31 *Do I need to report transportation emissions?*

As stated in the *Canada Gazette* notice of October 1, 2011, on-site transportation emissions must be reported under their own category. Only emissions from machinery used for the on-site transportation of substances, materials or products used in the production process of the facility should be reported. As an example, the transport of feed materials (e.g. by truck or rail) from their on-site storage location to a specific process unit would be reported under this category. An example of a transportation activity that would not be reported would be a manager who uses a company vehicle (e.g. pickup truck or car) to conduct inspections of activities on the grounds of the facility. Additionally, emissions from transportation to and from the facility should not be reported.

Q32 *How do I submit my GHG information to Environment Canada?*

You can submit your facility's GHG information to Environment Canada's GHG Emissions Reporting Program (GHGRP) through Environment Canada's Single Window System. This system is an on-line mechanism for reporting information to Environment Canada under specific programs and to other agencies and jurisdictions including:

- Environment Canada's National Pollutant Release Inventory (NPRI) program
- Alberta's Specified Gas Reporting Regulation (AB Reg. 251/2004)
- British Columbia's GHG Reporting Regulation (B.C. Reg. 272/2009)
- Ontario's GHG Reporting Regulation (O. Reg. 452/09).

Visit our website (www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=F3E7B38E-1) to find a link to the reporting system, and more information on how to access the system.

PUBLICATION AND CONFIDENTIALITY OF DATA

Q33 *What is this facility-level data used for? Is it part of the data for Canada's National Greenhouse Gas Inventory that is submitted annually to the United Nations?*

The facility data collected under the Greenhouse Gas Emissions Reporting Program supports a number of objectives including providing Canadians with information on GHG emissions, supporting the development of the National GHG Inventory and for regulatory development purposes. The facility data informs the National GHG Inventory submission that Canada must prepare and submit annually to the United Nations under the United Nations Framework Convention on Climate Change.

Canada's National Greenhouse Gas Inventory is broader than industrial sources, as it includes all sources and sinks of greenhouse gases caused by human activity. The inventory is largely based on emission estimates developed from national and provincial statistics. The facility data is used to compare and validate the national inventory estimates from industrial sources.

Q34 *Will the information I provide to Environment Canada be kept confidential?*

The information is being collected by Environment Canada, under the authority of CEPA 1999. The Minister of the Environment has indicated the intent to publish the GHG emission totals by gas by facility (pursuant to the, *Canada Gazette* notice). Persons will be afforded an opportunity to request that their information be treated as confidential and that it therefore not be published. If the Minister is of the view that the information for which a confidentiality request has been submitted is enveloped by one of the enumerated categories of information found in section 52 of CEPA 1999, then the Minister would be authorized to publish the information only pursuant to the public interest exemption found in subsection 53(3) of CEPA 1999. If the Minister questions the validity of a confidentiality request, procedures are set out in section 53 of CEPA 1999, affording persons an opportunity to further justify their claims with both the Minister and, failing that, the Federal Court. The information, once in the hands of Environment Canada, is subject to the provisions of the federal *Privacy Act* and the *Access to Information Act*.

Q35 *Some industries might be concerned that releasing their GHG emissions data to the public could affect their competitive position. How have you addressed those concerns in the reporting system?*

All facilities that exceed the threshold are required to report. Similar data are already being collected and disclosed by other governments, including the Government of Alberta. In addition, federal legislation provides companies with the opportunity to request the non-public disclosure of data whose publication they feel would jeopardize their competitive position, as defined under CEPA 1999. These provisions provide adequate protection of confidentiality where warranted, while at the same time ensuring public access to information that is in the public interest.

Q36 *Who will have access to information reported?*

The Minister of the Environment has indicated the intent to publish facility emissions data, i.e. emission totals by gas, by facility (except for confidential data protected under CEPA 1999). This information is published on Environment Canada's GHG website (www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=F3E7B38E-1).

Assuming that they have in force legislation that provides the authority to collect and compile the reporting of GHG emissions information, provinces or territories will be able to enter into a data-sharing agreement with Environment Canada. In accordance with their respective provincial or territorial legislation, a copy of the reported data could be made publicly available, subject to terms of provincial or territorial privacy and access to information laws.

Q37 *How do I request that my submission be treated as confidential?*

There are provisions under CEPA 1999 whereby reporters may submit, with the information that they are required to provide, a written request that this information be treated as confidential based on reasons set out in CEPA 1999 (section 52).

During the online process of reporting emissions, reporters will be asked if they are requesting confidentiality of their report under CEPA 1999. A similar question will be asked if there are applicable provincial/territorial statutes. The reporter must choose *yes* or *no*; if *yes* is chosen, the reporter must submit a written request along with justification and supporting documentation to Environment Canada (and the provincial government, if applicable). The reporter should send this written request by mail, postmarked no later than the reporting deadline. Environment Canada will be alerted by the online reporting system that the request has been made, and the entire submission will be kept confidential until the request is processed.

Q38 *If a reporter is granted confidentiality in the first reporting year, must that reporter submit a confidentiality request every year thereafter?*

Yes, a request for confidentiality must be submitted each year, since a request for confidentiality applies only to the reporting year in which the request was made.

Q39 *Is there an appeal process if a reporter has not been granted confidentiality? If so, what is the timeline to submit the appeal?*

Under CEPA 1999, a reporter has the ability to submit an appeal. As per section 53 of CEPA 1999, when a request for confidentiality is denied by Environment Canada, the department will inform the reporter that data submitted by the reporter will be published and that the reporter has the option of having this decision reviewed by the Federal Court within a thirty-day period. If no appeal to the Federal Court is made, then the information is made publicly available. If an appeal is made, the Federal Court reviews the confidentiality request and the reporter's information is kept confidential until this process is complete.

APPENDIX B : References

Environment Canada. 2009. National Inventory Report, 1990–2007, Greenhouse Gas Sources and Sinks in Canada. Environment Canada, Gatineau, Quebec, Canada.

Available online at: www.ec.gc.ca/ges-ghg

[IPCC] Intergovernmental Panel on Climate Change. 2000. Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories. Intergovernmental Panel on Climate Change National Greenhouse Gas Inventories Programme.

Available online at: www.ipcc-nggip.iges.or.jp/public/gp/english

[IPCC] Intergovernmental Panel on Climate Change. 2003. Good Practice Guidance for Land Use, Land-Use Change and Forestry. Intergovernmental Panel on Climate Change National Greenhouse Gas Inventories Programme.

Available online at: www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.htm

[IPCC] Intergovernmental Panel on Climate Change. 2006. 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Intergovernmental Panel on Climate Change National Greenhouse Gas Inventories Programme.

Available online at: www.ipcc-nggip.iges.or.jp/public/2006gl/index.html

United Nations. 1992. United Nations Framework Convention on Climate Change. Article 2, New York, USA.

Available online at: http://unfccc.int/resource/docs/convkp/conveng.pdf

www.**ec.gc.ca**

Additional information can be obtained at:

Environment Canada
Inquiry Centre
10 Wellington Street, 23rd Floor
Gatineau QC K1A 0H3
Telephone: 1-800-668-6767 (in Canada only) or 819-997-2800
Fax: 819-994-1412
TTY: 819-994-0736
Email: enviroinfo@ec.gc.ca